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EnSafe Inc.

Environmental and Management Consultants

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June 19, 2002

Ms. Beth Brown Walden
Remedial Project Manager
EPA Region IV
Atlanta Federal Center
100 Alabama Street, S.W.
Atlanta, Georgia 30303-3104

Re: Carrier Air Conditioning Superfund Site
Collierville, Tennessee
Annual 2001 Progress Report

Dear Ms. Walden:

On behalf of Carrier Corporation, EnSafe Inc. is pleased to submit the following progress report for the groundwater and air monitoring conducted in 2001. The report presents results of the 2001 quarterly sampling of groundwater monitoring wells and Water Plant 2, as well as results from the Main Plant Area and North Remediation Site soil-vapor extraction systems.

If you have any questions or comments, please do not hesitate to call me at (901) 372-7962.

Sincerely,

EnSafe Inc.

By: Lori Goetz

Enclosure

cc: Mr. Bryan Kielbania, UTC — Carrier
Mr. Frank Sizemore, UTC — Carrier
Mr. Jordan English, TDEC
Mr. Tim Overly, Town of Collierville

2001 ANNUAL PROGRESS REPORT

UTC — CARRIER AIR CONDITIONING
COLLIERVILLE, TENNESSEE

EnSafe Project Number: 3133-012-04-018-00

Prepared for:

UTC — Carrier
97 South Byhalia Road
Collierville, Tennessee

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962

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1.0 INTRODUCTION

This progress report outlines activities undertaken at Carrier's Collierville facility pursuant to the Unilateral Administrative Order for Remedial Design and Remedial Action (RD/RA). The report describes all the work conducted in 2001 and planned for 2002. It includes all plans, data, activities, and procedures completed and pending for groundwater and soil remediation at the UTC, Carrier Collierville site. This report presents the air and groundwater data collected at the facility during 2001.

Historically, progress reports have been submitted quarterly. However, as discussed with USEPA in September 2001, beginning with the 2001 data set reporting will be performed annually. Data from the last progress report (*First Quarter 2001 Progress Report* [EnSafe, 2001]), is also included in this report.

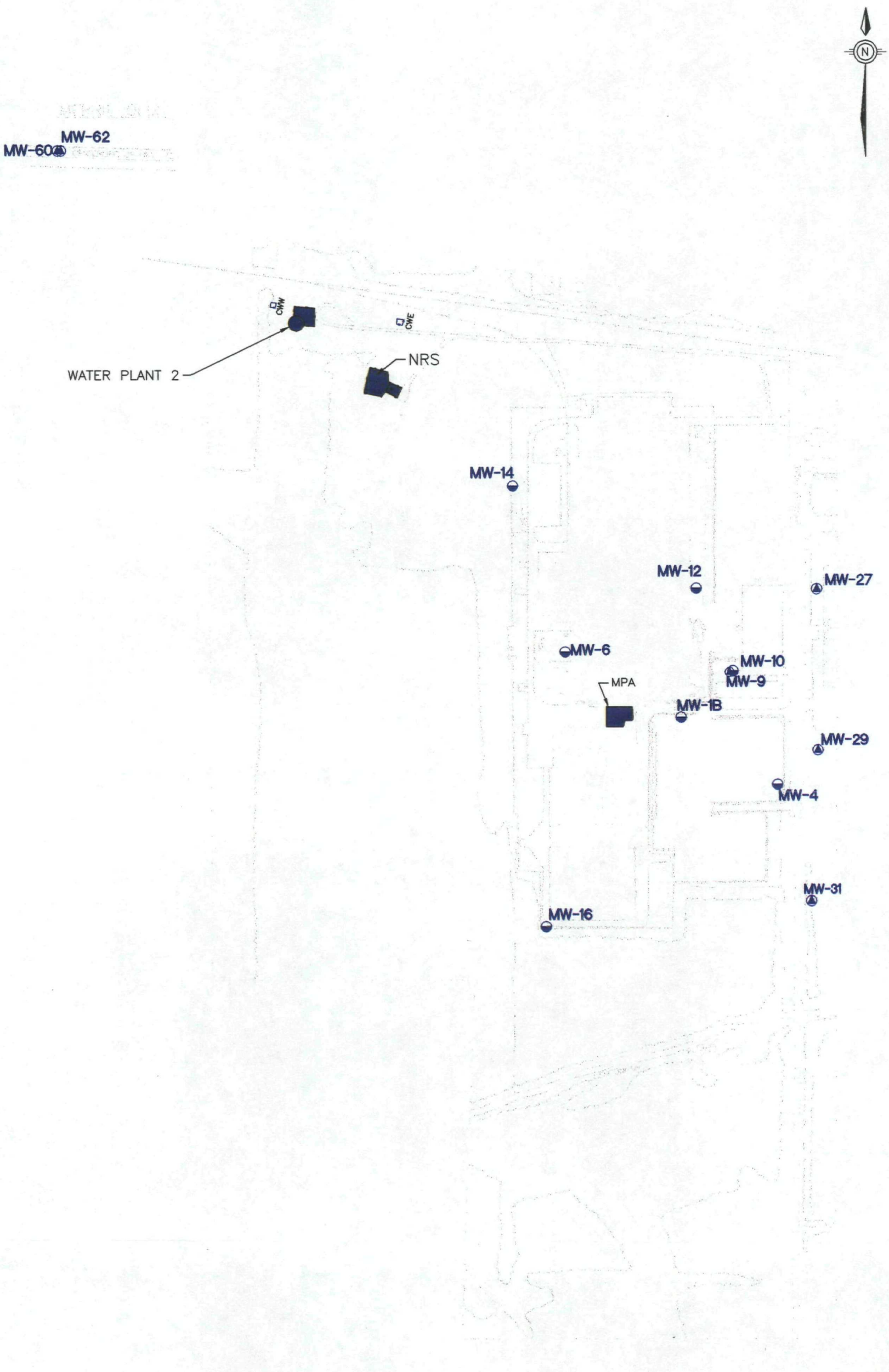
Three remediation systems operate at the site:

- The Town of Collierville's Water Plant #2 contains groundwater contaminants in the Memphis Sand, and controls exposure through treatment. The plant includes two extraction wells which pump water to two 5-foot-diameter air strippers to remove trichloroethene (TCE) and other volatile organics (VOCs) from groundwater.

- The North Remediation System (NRS) extracts site contaminants from soils impacted by the former lagoon via soil-vapor extraction (SVE).

- The Main Plant Area (MPA) SVE system extracts site contaminants from soils impacted by a spill near the main plant.

The three systems, as well as active monitoring wells, are shown on Figure 1.



LEGEND

- ◒ – MONITORING WELLS (DEEP)
- ◭ – MONITORING WELLS (SHALLOW)
- MW–62 – MONITORING WELL NUMBER
- CWW/CWE – CITY OF COLLIERVILLE MUNICIPAL WELLS

400 0 400

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FIGURE 1
ACTIVE MONITORING AND
REMEDIAL WELLS/SYSTEMS

DWG DATE: 04/25/01 | NAME: 3133012W001

2.0 GROUNDWATER

2.1 Groundwater Sampling Methods

Groundwater samples were collected as outlined in the *Groundwater Remedy Design Report* (EnSafe 1994) from existing monitoring wells MW-60 and MW-62, the city of Collierville's East and West wells and from the air stripper's effluent.

Effluent samples from the water plant's air stripper were obtained through a port installed in the stripper to allow sampling of treated groundwater. Similarly groundwater samples collected from the city's production wells were collected through a port on the side of the well. The Collierville East well (CWE) was sampled four times during 2001. Well refurbishment activities at the Collierville West well (CWW) took place during the first two quarters of 2001, therefore CWW was only sampled twice during 2001.

Monitoring well MW-31, which is screened in the perched groundwater downgradient from the plant area, has historically been used to gauge the effectiveness of the MPA remediation system. It was not sampled this past year. Road construction along Byhalia Road covered the well with approximately 3 feet of fill/asphalt material, therefore locating and resumed monitoring of this well are not practical under the existing conditions.

Groundwater samples were submitted to Southwest Laboratories of Oklahoma, in Broken Arrow, Oklahoma, for analysis of VOCs by USEPA-SW846 Method 8010, and lead and zinc were analyzed by USEPA-SW-846 Method 6010. Sampling protocol was followed on all sampling points as outlined in the *Groundwater Remedy Design Report, Appendix A, Performance Standards Verification Plan* (EnSafe 1994). Table 1 summarizes the wells sampled during each quarterly monitoring event and the sample designations used for each.

Table 1
Monitoring Wells, Sample Designations, and Dates

Well IDs	Sample ID Prefix	1st Qtr 2001 3/29/01	2nd Qtr 2001 6/14/01	3rd Qtr 2001 10/25/01	4th Qtr 2001 12/12/01
MW-60	CARG60	X	X	X	X
MW-62	CARG62	X	X	X	X
East Well	CARGEW	X	X	X	X
West Well	CARGWW	Under Repair	Under Repair	X	X
After Stripper	CARGAS	X	X	X	X
Duplicate Sample	CARH	East Well	East Well	East Well	After Stripper

2.2 Groundwater Analytical Results

Table 2 summarizes the results for chemicals of concern from monitoring wells, city wells, and after treatment through the air stripper. The complete data summary tables are presented in Appendix A at the end of this report.

Monitoring Wells 60 and 62

MW-60 and MW-62 serve as compliance monitoring wells for the capture zone of the two production wells CWE and CWW. MW-60 was completed to a depth of 385 feet, with a 20-foot screened interval beginning 70 feet below CWE's completion depth and 86 feet below CWW's completion depth. MW-62 was completed to a depth of 200 feet, with a 20-foot screened interval, about 75 feet above the top of the screen in CWE and 39 feet above the top of the screen in CWW.

Results from the second quarter of monitoring indicate trace levels (1 μg/L) of TCE's daughter products 1,2-dichloroethane and trans-1,2-dichloroethane in MW-60. Monitoring well MW-62 also contained traces of chlorinated compounds including 1,1,1-trichloroethene, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, dichlorobenzenes, vinyl chloride, and

methylene chloride. However, these detections were not confirmed during the third and fourth quarter sampling events nor have they been detected in previous sampling events, indicating that these detections are anomalous and likely attributable to laboratory cross-contamination. The overall absence of contaminants in these wells indicates that plume capture is maintained by the existing pump rates at CWW and CWE.

Table 2
Groundwater Analytical Results 2001
(in micrograms per liter)

Well ID	Constituent	1st Qtr. 2001 3/29/01	2nd Qtr. 2001 6/14/01	3rd Qtr. 2001 10/25/01	4th Qtr. 2001 12/17/01
MW60	Trichloroethene	1 U	1 U	1 U	1 U
	1,2-Dichloroethane	1 U	1	1 U	1 U
	trans-1,2-Dichloroethene	1 U	1	1 U	1 U
	Tetrachloroethene	1 U	1 U	1 U	1 U
	1,1,2,2-Tetrachloroethane	1 U	1 J	1 U	1 U
	Chloroform	1 U	1 U	1 U	1 U
	Vinyl Chloride	1 U	1 U	1 U	1 U
	Lead	2.7 J	1.2 U	1.6 U	1.6 U
	Zinc	23.3	5.1 J	4.7 B	2.7 B
MW-62	Trichloroethene	1 U	0.5 U	1 U	1 U
	1,1,1-Trichloroethane	1 U	0.2 J	1 U	1 U
	1,1,2-Trichloroethane	1 U	0.8 J	1 U	1 U
	Bromodichloromethane	1 U	0.2 J	1 U	1 U
	1,2-Dichloroethane	1 U	1 U	1 U	1 U
	trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U
MW-62	Tetrachloroethene	1 U	0.5 U	1 U	1 U
	1,1,2,2-Tetrachloroethane	1 U	0.6 J	1 U	1 U
	Methylene Chloride	1 U	2	5 U	5 U
	Chloroform	1 U	0.3 U	1 U	1 U

Table 2
Groundwater Analytical Results 2001
(in micrograms per liter)

Well ID	Constituent	1st Qtr. 2001 3/29/01	2nd Qtr. 2001 6/14/01	3rd Qtr. 2001 10/25/01	4th Qtr. 2001 12/17/01
	Vinyl Chloride	1 U	0.3 J	1 U	1 U
	1,2-Dichlorobenzene	1 U	0.4 J	1 U	1 U
	1,3-Dichlorobenzene	1 U	0.4 J	1 U	1 U
	1,4-Dichlorobenzene	1 U	0.5 J	1 U	1 U
	Lead	1.4 J	1.2 U	1.6 U	1.6 U
	Zinc	5.1 J	6 J	2.4 J	1.6 B
City Well East	Trichloroethene	100	69	110 D	130 D
	1,1,1-Trichloroethane	50 U	3 J	1 U	1 U
	1,1,2-Trichloroethane	50 U	5 J	1 U	1 U
	1,2-Dichloroethane	50 U	10 U	1 U	1 U
	1,1-Dichloroethane	50 U	10 U	1 U	1 U
	trans-1,2-Dichloroethene	50 U	10 U	1	1.2
	Tetrachloroethene	50 U	4 J	1 U	1 U
	1,1,2,2-Tetrachloroethane	50 U	10 U	1 U	1 U
	Bromodichloromethane	50 U	3 J	1 U	1 U
	Chloroform	50 U	16 U	1 U	1 U
	Vinyl Chloride	50 U	10 U	1 U	1 U
	1,2-Dichlorobenzene	50 U	3 J	1 U	1 U
	1,3-Dichlorobenzene	50 U	3 J	1 U	1 U
	1,4-Dichlorobenzene	50 U	3 J	1 U	1 U
	Lead	1.6 J	1.2 UJ	1.6 U	2.2 J
	Zinc	7.3 J	10.3 J	15 J	11 J

Table 2
Groundwater Analytical Results 2001
(in micrograms per liter)

Well ID	Constituent	1st Qtr. 2001 3/29/01	2nd Qtr. 2001 6/14/01	3rd Qtr. 2001 10/25/01	4th Qtr. 2001 12/17/01
City Well West	Trichloroethene	NS	NS	180 D	190 D
	1,2-Dichloroethane	NS	NS	1 U	1 U
	trans-1,2-Dichloroethene	NS	NS	0.29 J	0.27 J
	Tetrachloroethene	NS	NS	1 U	1 U
	1,1,2,2-Tetrachloroethane	NS	NS	1 U	1 U
	Chloroform	NS	NS	1 U	1 U
	Vinyl Chloride	NS	NS	1 U	1 U
	Lead	NS	NS	1.6 U	1.6 U
	Zinc	NS	NS	310	34
After Stripper	Trichloroethene	1	3	2.6	3.1
	1,2-Dichloroethane	1 U	1 U	1 U	1 U
	trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U
	Tetrachloroethene	1 U	1 U	1 U	1 U
	1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U
	Chloroform	1 U	1 U	1 U	1 U
	Vinyl Chloride	1 U	1 U	1 U	1 U
	1,2-Dichlorobenzene	1 U	1 U	1 U	1 U
	1,3-Dichlorobenzene	1 U	1 U	1 U	1 U
	1,4-Dichlorobenzene	1 U	1 U	1 U	1 U
	Lead	2 J	1.2 U	1.7 J	1.6 U
	Zinc	72.6	25.3	34	23

Notes:
U = Undetected below contract-required quantitation limit.
J = Estimated value. Presence of the compound was confirmed, but less than the reported detection limit.
B = Estimated value. Analyte detected below the practical quantitation limit.

City Well East and City Well West

TCE concentrations in CWE ranged between 69 and 100 micrograms per liter (μg/L) over the four quarters of 2001 monitoring while concentrations in CWW ranged were 170 and 190 μg/L during the third and fourth quarters. As shown in Figure 2, TCE concentrations in both production wells are consistent with historical detections.

Water Plant 2 Operation

Approximately 400 million gallons of water were treated at Water Plant 2 during 2001. The rolling average concentration over the past 3 quarters was used to calculate the removal rates for Water Plant 2; approximately 366 pounds of TCE mass were removed over the year. Table 3 shows the gallons treated and mass of TCE removed during each quarter and calculations are provided in Appendix B. To date, 3,885 pounds of TCE have been removed from Water Plant #2.

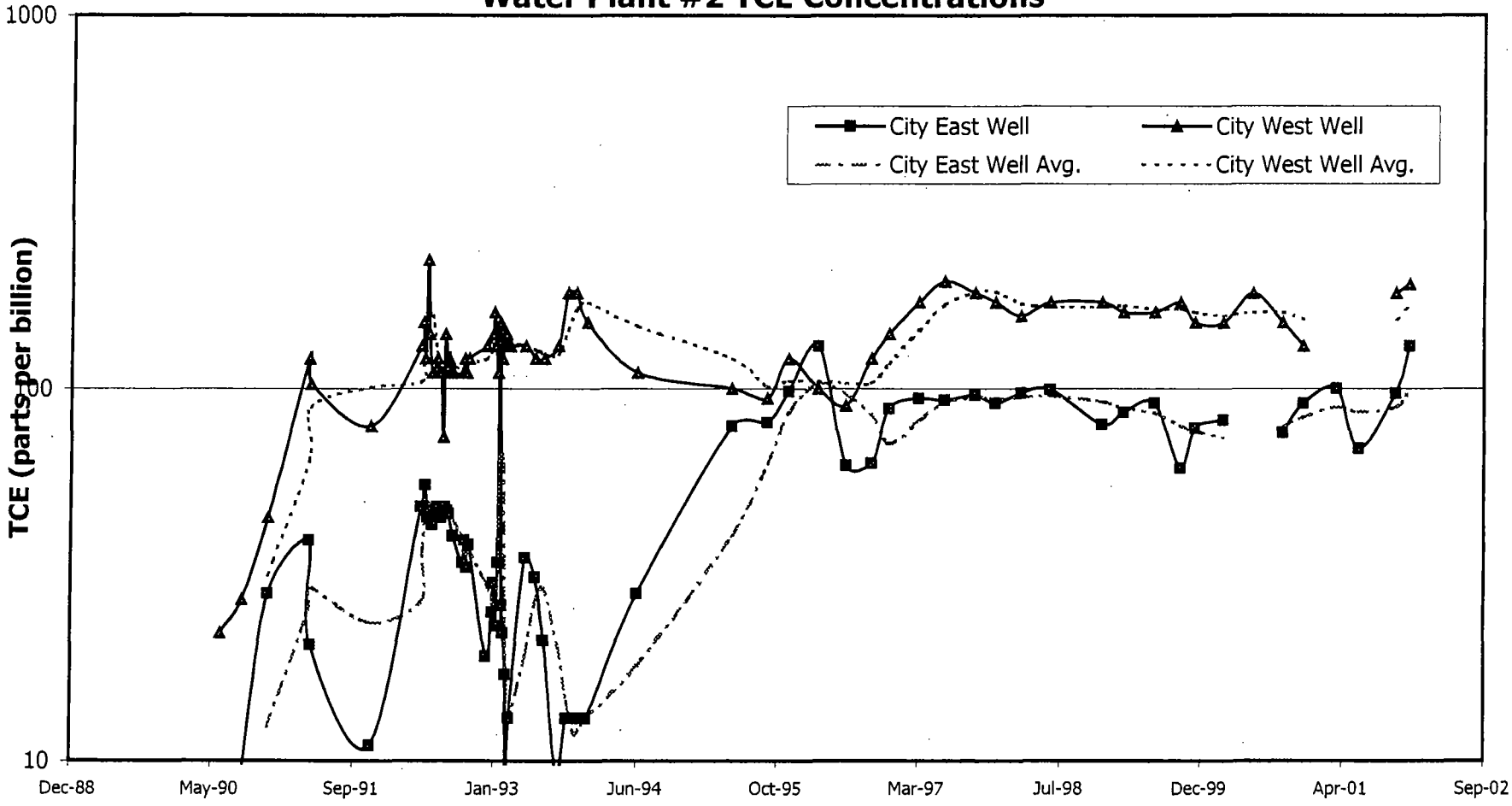
Table 3
Water Plant #2 Volumes Treated and TCE Mass Removed

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Water Treated (Millions of Gallons)	90.7	104	107	99	**400**
Mass TCE Removed (lbs)	68	76	109	110	**366**

2.3 Planned 2002 Groundwater Sampling Activities

All wells sampled during 2001 are scheduled to be sampled again quarterly during 2002. No changes to the protocol are expected.

Figure 2
Water Plant #2 TCE Concentrations



Water Plant #2 O&M

TCE concentrations after treatment in the air stripping towers appeared to rise in 2001, compared to historical levels. Concentrations increased from non-detectable levels to 2 to 3 μg/L, approximately half the maximum contaminant level (MCL) for TCE.

System inspections were performed in December 2001, and determined that production well improvements made by the Town of Collierville in 2000 and 2001 resulted in increased flow rates, up to approximately 650 gpm from each well. These increased flow rates were higher than the design flow for the air stripping system (500 gpm), which resulted in reduced air-to-water ratios. In addition, air-to-water ratios were further reduced by fouling/plugging in the air stripper distribution lines. To re-establish optimum operating conditions, four tasks were defined:

- Replacement of lateral distributors at the top of the air stripping towers to ensure even distribution of water across the entire tower diameter.

- Replacement of the top 1 foot of packing media with packing which more evenly distributes flow.

- Replacement of blower motors with higher horsepower motors, with resulting increases air flow rates.

- Replacement of each tower's 4 square foot intakes air screen with a larger, 16-square-foot screen for improved air flow.

The first three tasks were completed during January and February 2002. The fourth task was completed in April 2002. Performance data from March 2002 indicates that these maintenance activities have improved treatment effectiveness and TCE is no longer detected in air stripper effluent.

3.0 SOIL

3.1 Main Plant Area (MPA) SVE System

3.1.1 Operation and Maintenance

During 2001, the MPA SVE system operated approximately 75% and 68% of the year for the shallow and deep wells, respectively. The number of days of operation measured during each quarter are provided in Table 4. Flow rates are estimated to have been 30 cubic feet per minute (cfm) for the shallow well manifold and 40 cfm for the deep well. The average vacuum generated by the blower in the Main Plant Area was 100 to 120 inches of water.

Downtime occurred mostly during the months of January and February, historically wet periods which cause high-level alarms in the system demister tank. In December 2001 the system was shut down for carbon replacement. Despite repeated attempts to re-start the system, water intake due to inclement weather prevented continuous operation of the system during the latter part of December. During 2001, approximately 10 to 12 drums of water were drained from the demister tank and disposed of offsite as hazardous waste.

3.1.2 MPA Analytical Results

Analytical results of soil vapor in the MPA system were collected from the shallow, deep, and combined manifolds (shallow and deep together) before carbon treatment. Combined results are provided in Table 4 with the operational time measured each quarter. Shallow and deep data are presented in Appendix C. Shallow data appear anomalously low (less than 10 μg/L) compared to previous quarters (typically greater than 100 μg/L), and therefore have been disregarded in favor of more reliable combined-manifold results. Shallow and deep manifolds ran almost continuously during 2001 (shallow 286 days, deep wells 247 days). Significant variability is shown in the TCE mass concentrations measured during the four sampling events. Because combined manifold data are not compatible with previous results (shallow versus deep), these data have not been graphed.

Table 4
MPA SVE Data — 2001 Data

Manifold	Sample Date	TCE (µg/L)
Combined Manifold (before carbon)	January 25	403
	February 26	159
	May 2	1,014
	November 6	625
After Carbon 1	January 25	3.01
	February 26	< 1
	May 2	1200
	November 6	1620 *
After Carbon 2	January 25	5.23
	February 26	< 1
	May 2	53.9
	November 6	1560 *

Notes:
µg/L = micrograms per liter
* = carbon units replaced mid -December

Data collected during 2001 and historical sampling data are provided in Appendix C. Effluent concentrations were also periodically collected from the carbon units to detect breakthrough. As shown in Table 4, elevated effluent concentrations were measured in carbon unit 1 in May and in both carbon units in November. The MPA system was immediately shut down and carbon was replaced in mid-December.

Horizontal wells were not operated for any significant duration during 2001.

3.1.3 Mass Removal

Combined shallow/deep manifold concentrations have been used to approximate total mass removed from the system. Combined manifold concentrations were averaged for the entire year, with a resulting average concentration of 550 μg/L for 2001. Assuming 286 days of operation, approximately 987 pounds of TCE were removed from the system in 2001. Given higher flow rates possible through the underlying sand zone, it is expected that the majority of mass removal occurred from the deep well.

3.2 NRS SVE System

3.2.1 Operation and Maintenance

The NRS SVE system operated continuously until October 2001, when blower failure occurred. The NRS was shut down pending the results of the planned soil confirmation sampling event, to determine the need for blower replacement given soil TCE concentrations. Flow rates are estimated to have averaged 20 cfm for the shallow well manifold and 180 cfm for the deep wells. The average vacuum generated by the blower was 100 to 120 inches of water.

3.2.2 NRS Analytical Results

Analytical results of the air sampling conducted at NRS are provided in Table 5 with the operational time measured each quarter. As shown in Figure 3, despite some variability, concentrations are generally within the historical range detected previously in the shallow and deep wells. Data collected in 2001 is provided in Appendix D with historical monitoring data.

Figure 3
NRS -- TCE Vapor Concentrations

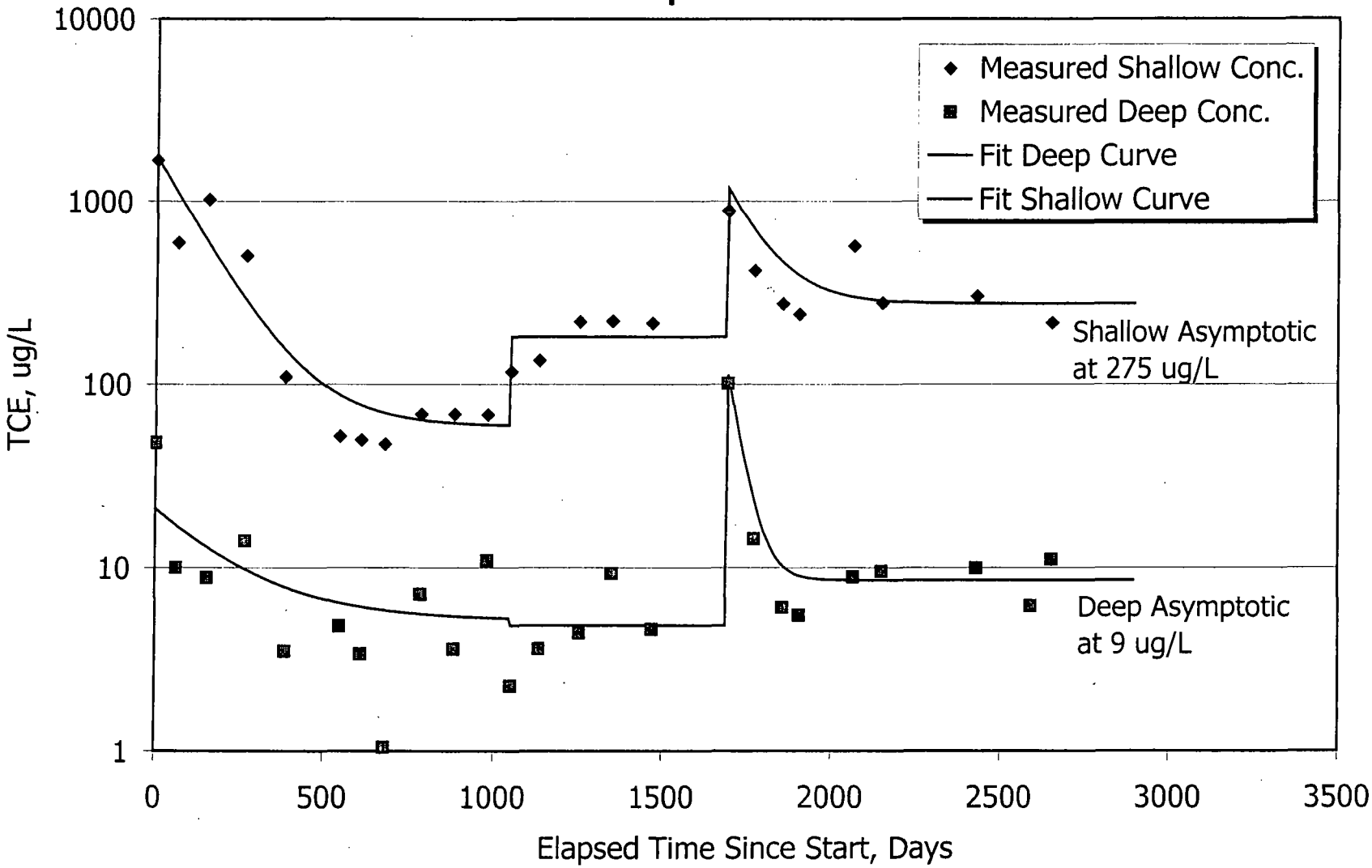


Table 5
NRS SVE Data — First Quarter 2001

Manifold	Sample Date	TCE (µg/L)	Approximate Operation Time during This Quarter
Shallow Wells	January 25	1,460	1st Qtr 90 Days
	February 26	237	2nd Qtr 91 Days
	May 2	216	3rd Qtr 91 Days
	November 6	NA	4th Qtr 31 Days
			Total 303 Days
Deep Wells	January 25, 2001	97.1	1st Qtr 90 Days
	February 26, 2001	6.19	2nd Qtr 91 Days
	May 2	11.1	3rd Qtr 91 Days
	November 6	NA	4th Qtr 31 Days
			Total 303 Days

Note:

NA = Sample not collected in November due to system being shut down as a result of excessive moisture entering system.

3.2.3 Mass Removal

For this report, the concentration removal curves for shallow and deep extraction have been re-evaluated to fit the more comprehensive data set. As shown in Figure 3, removal operations at the NRS can be segmented into five phases:

- Initial exponential removal rates, which occurred during the first year graphed (January 1994 through February 1995).

- Initial asymptotic levels, indicating diffusion controlled removal rates, which occurred from February 1995 through September 1996.

- An abrupt jump in concentrations following system optimization in September 1996. Concentrations are stable (asymptotic) through mid-1998.

- Following blower replacement in late 1998, a rise in concentrations followed by exponential decay from November 1998 through January 1999.

- Re-stabilization of concentrations around a new asymptote beginning in January 1999; conditions have been relatively constant since that time.

Asymptotic levels were used to re-calculate mass removals for the NRS. Estimated mass removals since late 1998, when the NRS blower was replaced, are shown in Table 6.

Table 6
NRS Removal Totals — Late 1998 through 2001

	Shallow Wells (lbs)	Deep Wells (lbs)
1998 (4th Quarter only)	45	13
1999	179	53
2000	179	53
2001	149	44

3.3 Planned 2002 Activities

In 2002, both the MPA and NRS areas were sampled to determine soil concentrations; data are being compared with the site's cleanup goal of 533 μg/kg for TCE. Sampling techniques are described in the *Draft Soil Confirmation Sampling Work Plan* (EnSafe, November 13, 2000).

Following data review, Carrier will either petition to shut down the remediation systems, or it will modify the remediation system operations to target residual mass.

Both systems are currently down for repairs. Maintenance activities planned following data analysis include:

- NRS blower motor replacement.
- MPA demister tank replacement.
- Installation of an hourmeter and additional flow gauges at MPA to better track operations.
- Inspection/testing of all sampling ports at both MPA and NRS given anomalous results obtained at the shallow MPA port during 2001.

These evaluation and modification activities (or a recommendation for shutdown) are expected to be completed by September 2002.

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APPENDIX A

GROUNDWATER ANALYTICAL DATA SUMMARY TABLES

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 3/01

HAL VOA						
SAMPLE ID ------->	CAR-G-6003-01	CAR-G-6203-01	CAR-G-AS03-01	CAR-G-EW03-01	CAR-H-EW03-01	
ORIGINAL ID ----->	CARG600301	CARG620301	CARGAS0301	CARGEW0301	CARHEW0301	
LAB SAMPLE ID --->	46143.02	46143.06	46143.05	46143.07	46143.04	
ID FROM REPORT -->	CARG600301	CARG620301	CARGAS0301	CARGEW0301	CARHEW0301	
SAMPLE DATE ----->	03/29/01	03/29/01	03/29/01	03/29/01	03/29/01	
DATE ANALYZED --->	04/04/01	04/04/01	04/04/01	04/04/01	04/04/01	
MATRIX ---------->	Water	Water	Water	Water	Water	
UNITS ----------->	UG/L	UG/L	UG/L	UG/L	UG/L	

CAS #	Parameter	46143	VAL	46143	VAL	46143	VAL	46143	VAL	46143	VAL	
75-01-4	Vinyl chloride											
74-83-9	Bromomethane											
75-00-3	Chloroethane											
75-69-4	Trichlorofluoromethane											
75-35-4	1,1-Dichloroethene											
75-09-2	Methylene chloride											
156-60-5	trans-1,2-Dichloroethene											
75-34-3	1,1-Dichloroethane											
67-66-3	Chloroform											
71-55-6	1,1,1-Trichloroethane											
56-23-5	Carbon tetrachloride											
107-06-2	1,2-Dichloroethane											
79-01-6	Trichloroethene					1.		100.		100.		
78-87-5	1,2-Dichloropropane											
75-27-4	Bromodichloromethane											
110-75-8	2-Chloroethylvinylether											
10061-01-5	cis-1,3-Dichloropropene											
10061-02-6	trans-1,3-Dichloropropene											
79-00-5	1,1,2-Trichloroethane											
127-18-4	Tetrachloroethene											
124-48-1	Dibromochloromethane											
106-93-4	1,2-Dibromoethane											
108-90-7	Chlorobenzene											
75-25-2	Bromoform											
79-34-5	1,1,2,2-Tetrachloroethane											
541-73-1	1,3-Dichlorobenzene											
106-46-7	1,4-Dichlorobenzene											
95-50-1	1,2-Dichlorobenzene											
74-87-3	Chloromethane											

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 3/01

METALS	SAMPLE ID ------->	CAR-G-6003-01	CAR-G-6203-01	CAR-G-AS03-01	CAR-G-EW03-01	CAR-H-EW03-01
	ORIGINAL ID ----->	CARG600301	CARG620301	CARGAS0301	CARGEW0301	CARHEW0301
	LAB SAMPLE ID --->	46143.02	46143.06	46143.05	46143.07	46143.04
	ID FROM REPORT -->	CARG600301	CARG620301	CARGAS0301	CARGEW0301	CARHEW0301
	SAMPLE DATE ----->	03/29/01	03/29/01	03/29/01	03/29/01	03/29/01
	DATE EXTRACTED -->	04/03/01	04/03/01	04/03/01	04/03/01	04/03/01
	DATE ANALYZED --->	04/10/01	04/10/01	04/10/01	04/10/01	04/10/01
	MATRIX ---------->	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	46143	VAL	46143	VAL	46143	VAL	46143	VAL	46143	VAL
7439-92-1	Lead	2.7	J	1.4	J	2.	J	1.6	J	1.4	J
7440-66-6	Zinc	23.3		5.1	J	72.6		7.3	J	6.8	J

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 6/01

HAL VOA											
	SAMPLE ID ------>	CAR-G-6006-01		CAR-G-6206-01		CAR-G-AS06-01		CAR-G-EW06-01		CAR-H-EW06-01	
	ORIGINAL ID ----->	CARG600601		CARG620601		CARGAS0601		CARGEW0601		CARHEW0601	
	LAB SAMPLE ID --->	46778.02		46778.01		46778.04		46778.03		46778.05	
	ID FROM REPORT -->	CARG600601		CARG620601		CARGAS0601		CARGEW0601		CARHEW0601	
	SAMPLE DATE ----->	06/14/01		06/14/01		06/14/01		06/14/01		06/14/01	
	DATE EXTRACTED -->	06/28/01		06/28/01		06/28/01		06/28/01		06/28/01	
	DATE ANALYZED --->	06/28/01		06/28/01		06/28/01		06/28/01		06/28/01	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ----------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	46778	VAL	46778	VAL	46778	VAL	46778	VAL	46778	VAL
74-87-3	Chloromethane										
75-01-4	Vinyl chloride			0.3	J						
74-83-9	Bromomethane										
75-00-3	Chloroethane										
75-69-4	Trichlorofluoromethane										
75-35-4	1,1-Dichloroethene	1.								11.	
75-09-2	Methylene chloride										
156-60-5	trans-1,2-Dichloroethene	1.									
75-34-3	1,1-Dichloroethane	1.									
67-66-3	Chloroform										
71-55-6	1,1,1-Trichloroethane	1.		0.2	J			3.	J		
56-23-5	Carbon tetrachloride	1.									
107-06-2	1,2-Dichloroethane	1.									
79-01-6	Trichloroethene					3.		69.		92.	
78-87-5	1,2-Dichloropropane	1.									
75-27-4	Bromodichloromethane	1.		0.2	J			3.	J		
110-75-8	2-Chloroethylvinylether										
10061-01-5	cis-1,3-Dichloropropene	0.9	J								
10061-02-6	trans-1,3-Dichloropropene	1.									
79-00-5	1,1,2-Trichloroethane	1.		0.8	J			5.	J		
127-18-4	Tetrachloroethene							4.	J		
124-48-1	Dibromochloromethane	0.9	J								
106-93-4	1,2-Dibromoethane	0.6	J								
108-90-7	Chlorobenzene	1.									
75-25-2	Bromoform	2.									
79-34-5	1,1,2,2-Tetrachloroethane	1.	J	0.6	J						
541-73-1	1,3-Dichlorobenzene	1.		0.4	J			3.	J		
106-46-7	1,4-Dichlorobenzene	1.		0.5	J			3.	J		
95-50-1	1,2-Dichlorobenzene	1.		0.4	J			3.	J		

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 6/01

METALS	SAMPLE ID ------>	CAR-G-6006-01	CAR-G-6206-01	CAR-G-AS06-01	CAR-G-EW06-01	CAR-H-EW06-01
	ORIGINAL ID ----->	CARG600601	CARG620601	CARGAS0601	CARGEW0601	CARHEW0601
	LAB SAMPLE ID --->	46778.02	46778.01	46778.04	46778.03	46778.05
	ID FROM REPORT -->	CARG600601	CARG620601	CARGAS0601	CARGEW0601	CARHEW0601
	SAMPLE DATE ----->	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01
	DATE EXTRACTED -->	06/19/01	06/19/01	06/19/01	06/19/01	06/19/01
	DATE ANALYZED --->	06/21/01	06/21/01	06/21/01	06/21/01	06/21/01
	MATRIX ---------->	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	46778	VAL	46778	VAL	46778	VAL	46778	VAL	46778	VAL
7439-92-1	Lead									11.8	J
7440-66-6	Zinc	5.1	J	6.	J	25.3		10.3	J	184.	J

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 10/01

HAL VOA							
SAMPLE ID ------->	CAR-G-6010-01	CAR-G-6210-01	CAR-G-AS10-01	CAR-G-EW10-01	CAR-H-EW10-01	CAR-G-WW10-01
ORIGINAL ID ----->	CARG601001	CARG621001	CARGAS1001	CARGEW1001	CARHEW1001	CARGWW1001
LAB SAMPLE ID --->	S116969*3	S116969*4	S116969*5	S116969*6	S116969*7	S116969*8
ID FROM REPORT -->	CARG601001	CARG621001	CARGAS1001	CARGEW1001	CARHEW1001	CARGWW1001
SAMPLE DATE ----->	10/25/01	10/25/01	10/25/01	10/25/01	10/25/01	10/25/01
DATE ANALYZED --->	10/30/01	10/30/01	10/30/01	10/30/01	10/30/01	10/30/01
MATRIX ---------->	Water	Water	Water	Water	Water	Water
UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	UTC01 VAL	UTC01 VAL	UTC01 VAL	UTC01 VAL	UTC01 VAL	UTC01 VAL
71-55-6	1,1,1-Trichloroethane						
79-34-5	1,1,2,2-Tetrachloroethane						
79-00-5	1,1,2-Trichloroethane						
75-34-3	1,1-Dichloroethane						
75-35-4	1,1-Dichloroethene						
95-50-1	1,2-Dichlorobenzene						
107-06-2	1,2-Dichloroethane						
78-87-5	1,2-Dichloropropane						
541-73-1	1,3-Dichlorobenzene						
106-46-7	1,4-Dichlorobenzene						
75-27-4	Bromodichloromethane						
75-25-2	Bromoform						
74-83-9	Bromomethane						
56-23-5	Carbon tetrachloride						
108-90-7	Chlorobenzene						
75-00-3	Chloroethane						
67-66-3	Chloroform						
74-87-3	Chloromethane						
156-60-5	trans-1,2-Dichloroethene				1.	0.95 J	0.29 J
124-48-1	Dibromochloromethane						
75-71-8	Dichlorodifluoromethane						
75-09-2	Methylene chloride						
127-18-4	Tetrachloroethene						
79-01-6	Trichloroethene			2.6	110. D	97. D	180. D
75-69-4	Trichlorofluoromethane						
75-01-4	Vinyl chloride						
10061-01-5	cis-1,3-Dichloropropene						
10061-02-6	trans-1,3-Dichloropropene						

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 10/01

METALS	SAMPLE ID ------>	CAR-G-6010-01	CAR-G-6210-01	CAR-G-AS10-01	CAR-G-EW10-01	CAR-H-EW10-01	CAR-G-WW10-01
	ORIGINAL ID ----->	CARG601001	CARG621001	CARGAS1001	CARGEW1001	CARHEW1001	CARGWW1001
	LAB SAMPLE ID --->	S116969*3	S116969*4	S116969*5	S116969*6	S116969*7	S116969*8
	ID FROM REPORT -->	CARG601001	CARG621001	CARGAS1001	CARGEW1001	CARHEW1001	CARGWW1001
	SAMPLE DATE ----->	10/25/01	10/25/01	10/25/01	10/25/01	10/25/01	10/25/01
	DATE EXTRACTED -->	10/30/01	10/30/01	10/30/01	10/30/01	10/30/01	10/30/01
	DATE ANALYZED --->	11/01/01	11/01/01	11/01/01	11/01/01	11/01/01	11/01/01
	MATRIX ---------->	Water	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL
7439-92-1	Lead					1.7	J						
7440-66-6	Zinc	4.7	J	2.4	J	34.		15.	J	8.5	J	310.	

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 12/01

HAL VOA							
SAMPLE ID ------->	CAR-G-6012-01	CAR-G-6212-01	CAR-G-AS12-01	CAR-H-AS12-01	CAR-G-EW12-01	CAR-G-WW12-01
ORIGINAL ID ----->	CARG601201	CARG621201	CARGAS1201	CARHAS1201	CARGEW1201	CARGWW1201
LAB SAMPLE ID --->	S118124*8	S118124*7	S118124*3	S118124*4	S118124*6	S118124*5
ID FROM REPORT -->	CARG601201	CARG621201	CARGAS1201	CARHAS1201	CARGFW1201	CARGWW1201
SAMPLE DATE ----->	12/12/01	12/12/01	12/12/01	12/12/01	12/12/01	12/12/01
DATE ANALYZED --->	12/17/01	12/17/01	12/17/01	12/17/01	12/19/01	12/17/01
MATRIX ---------->	Water	Water	Water	Water	Water	Water
UNITS ----------->	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	UTCO2	VAL	UTCO2	VAL	UTCO2	VAL	UTCO2	VAL	UTCO2	VAL	UTCO2	VAL
71-55-6	1,1,1-Trichloroethane												
79-34-5	1,1,2,2-Tetrachloroethane												
79-00-5	1,1,2-Trichloroethane												
75-34-3	1,1-Dichloroethane												
75-35-4	1,1-Dichloroethene												
95-50-1	1,2-Dichlorobenzene												
107-06-2	1,2-Dichloroethane												
78-87-5	1,2-Dichloropropane												
541-73-1	1,3-Dichlorobenzene												
106-46-7	1,4-Dichlorobenzene												
75-27-4	Bromodichloromethane												
75-25-2	Bromoform												
74-83-9	Bromomethane												
56-23-5	Carbon tetrachloride												
108-90-7	Chlorobenzene												
75-00-3	Chloroethane												
67-66-3	Chloroform												
74-87-3	Chloromethane												
156-60-5	trans-1,2-Dichloroethene									1.2		0.27	J
124-48-1	Dibromochloromethane												
75-71-8	Dichlorodifluoromethane												
75-09-2	Methylene chloride												
127-18-4	Tetrachloroethene												
79-01-6	Trichloroethene					3.1		3.3		130.	D	190.	D
75-69-4	Trichlorofluoromethane												
75-01-4	Vinyl chloride												
10061-01-5	cis-1,3-Dichloropropene												
10061-02-6	trans-1,3-Dichloropropene												

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 12/01

METALS	SAMPLE ID ------>	CAR-G-6012-01	CAR-G-6212-01	CAR-G-AS12-01	CAR-H-AS12-01	CAR-G-EW12-01	CAR-G-WW12-01
	ORIGINAL ID ----->	CARG601201	CARG621201	CARGAS1201	CARHAS1201	CARGEW1201	CARGWW1201
	LAB SAMPLE ID --->	S118124*8	S118124*7	S118124*3	S118124*4	S118124*6	S118124*5
	ID FROM REPORT -->	CARG601201	CARG621201	CARGAS1201	CARHAS1201	CARGFW1201	CARGWW1201
	SAMPLE DATE ----->	12/12/01	12/12/01	12/12/01	12/12/01	12/12/01	12/12/01
	DATE EXTRACTED -->	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01
	DATE ANALYZED --->	12/18/01	12/18/01	12/18/01	12/18/01	12/18/01	12/18/01
	MATRIX ---------->	Water	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL
7439-92-1	Lead									2.2	J		
7440-66-6	Zinc	2.7	J	1.6	J	23.	J	48.	J	11.	J	34.	

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 3/01

HAL VOA											
	SAMPLE ID ------>	CAR-G-6003-01		CAR-G-6203-01		CAR-G-AS03-01		CAR-G-EW03-01		CAR-H-EW03-01	
	ORIGINAL ID ----->	CARG600301		CARG620301		CARGAS0301		CARGEW0301		CARHEW0301	
	LAB SAMPLE ID --->	46143.02		46143.06		46143.05		46143.07		46143.04	
	ID FROM REPORT -->	CARG600301		CARG620301		CARGAS0301		CARGEW0301		CARHEW0301	
	SAMPLE DATE ----->	03/29/01		03/29/01		03/29/01		03/29/01		03/29/01	
	DATE ANALYZED --->	04/04/01		04/04/01		04/04/01		04/04/01		04/04/01	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ----------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	46143	VAL	46143	VAL	46143	VAL	46143	VAL	46143	VAL
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	50.	U	5.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	50.	U	5.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	50.	U	5.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	50.	U	5.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	50.	U	5.	U
75-09-2	Methylene chloride	1.	U	1.	U	1.	U	50.	U	5.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	50.	U	5.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	50.	U	5.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	50.	U	5.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	50.	U	5.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	50.	U	5.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	50.	U	5.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.		100.		100.	
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	50.	U	5.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	50.	U	5.	U
110-75-8	2-Chloroethylvinylether	1.	U	1.	U	1.	U	50.	U	5.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	50.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	50.	U	5.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	50.	U	5.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	50.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	50.	U	5.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	50.	U	5.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	50.	U	5.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	50.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	50.	U	5.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	50.	U	5.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	50.	U	5.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	50.	U	5.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	50.	U	5.	U

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 3/01

METALS	SAMPLE ID ------>	CAR-G-6003-01	CAR-G-6203-01	CAR-G-AS03-01	CAR-G-EW03-01	CAR-H-EW03-01
	ORIGINAL ID ----->	CARG600301	CARG620301	CARGAS0301	CARGEW0301	CARHEW0301
	LAB SAMPLE ID --->	46143.02	46143.06	46143.05	46143.07	46143.04
	ID FROM REPORT -->	CARG600301	CARG620301	CARGAS0301	CARGEW0301	CARHEW0301
	SAMPLE DATE ----->	03/29/01	03/29/01	03/29/01	03/29/01	03/29/01
	DATE EXTRACTED -->	04/03/01	04/03/01	04/03/01	04/03/01	04/03/01
	DATE ANALYZED --->	04/10/01	04/10/01	04/10/01	04/10/01	04/10/01
	MATRIX ---------->	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	46143	VAL	46143	VAL	46143	VAL	46143	VAL	46143	VAL
7439-92-1	Lead	2.7	J	1.4	J	2.	J	1.6	J	1.4	J
7440-66-6	Zinc	23.3		5.1	J	72.6		7.3	J	6.8	J

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 6/01

HAL VOA											
	SAMPLE ID ------>	CAR-G-6006-01		CAR-G-6206-01		CAR-G-AS06-01		CAR-G-EW06-01		CAR-H-EW06-01	
	ORIGINAL ID ----->	CARG600601		CARG620601		CARGAS0601		CARGEW0601		CARHEW0601	
	LAB SAMPLE ID --->	46778.02		46778.01		46778.04		46778.03		46778.05	
	ID FROM REPORT -->	CARG600601		CARG620601		CARGAS0601		CARGEW0601		CARHEW0601	
	SAMPLE DATE ----->	06/14/01		06/14/01		06/14/01		06/14/01		06/14/01	
	DATE EXTRACTED -->	06/28/01		06/28/01		06/28/01		06/28/01		06/28/01	
	DATE ANALYZED --->	06/28/01		06/28/01		06/28/01		06/28/01		06/28/01	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	46778	VAL	46778	VAL	46778	VAL	46778	VAL	46778	VAL
74-87-3	Chloromethane	1.	U	1.	U	1.	U	10.	U	10.	U
75-01-4	Vinyl chloride	1.	U	0.3	J	1.	U	10.	U	10.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	10.	U	10.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	1.		1.	U	1.	U	10.	UJ	11.	
75-09-2	Methylene chloride	6.	U	2.	U	4.	U	36.	U	44.	U
156-60-5	trans-1,2-Dichloroethene	1.		1.	U	1.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	1.		1.	U	1.	U	10.	U	10.	U
67-66-3	Chloroform	1.	U	0.3	U	1.	U	16.	U	13.	U
71-55-6	1,1,1-Trichloroethane	1.		0.2	J	1.	U	3.	J	10.	UJ
56-23-5	Carbon tetrachloride	1.		1.	U	1.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	1.		1.	U	1.	U	10.	U	10.	U
79-01-6	Trichloroethene	1.	U	0.5	U	3.		69.		92.	
78-87-5	1,2-Dichloropropane	1.		1.	U	1.	U	10.	U	10.	U
75-27-4	Bromodichloromethane	1.		0.2	J	1.	U	3.	J	10.	UJ
110-75-8	2-Chloroethylvinylether	1.	U	1.	U	1.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	0.9	J	1.	U	1.	U	10.	U	10.	U
10061-02-6	trans-1,3-Dichloropropene	1.		1.	U	1.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	1.		0.8	J	1.	U	5.	J	10.	U
127-18-4	Tetrachloroethene	1.	U	0.5	U	1.	U	4.	J	10.	UJ
124-48-1	Dibromochloromethane	0.9	J	1.	U	1.	U	10.	U	10.	U
106-93-4	1,2-Dibromoethane	0.6	J	1.	U	1.	U	10.	U	10.	U
108-90-7	Chlorobenzene	1.		1.	U	1.	U	10.	U	10.	U
75-25-2	Bromoform	2.		1.	U	1.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	J	0.6	J	1.	U	10.	U	10.	U
541-73-1	1,3-Dichlorobenzene	1.		0.4	J	1.	U	3.	J	10.	UJ
106-46-7	1,4-Dichlorobenzene	1.		0.5	J	1.	U	3.	J	10.	UJ
95-50-1	1,2-Dichlorobenzene	1.		0.4	J	1.	U	3.	J	10.	UJ

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 6/01

METALS	SAMPLE ID ------>	CAR-G-6006-01		CAR-G-6206-01		CAR-G-AS06-01		CAR-G-EW06-01		CAR-H-EW06-01	
	ORIGINAL ID ----->	CARG600601		CARG620601		CARGAS0601		CARGEW0601		CARHEW0601	
	LAB SAMPLE ID --->	46778.02		46778.01		46778.04		46778.03		46778.05	
	ID FROM REPORT -->	CARG600601		CARG620601		CARGAS0601		CARGEW0601		CARHEW0601	
	SAMPLE DATE ----->	06/14/01		06/14/01		06/14/01		06/14/01		06/14/01	
	DATE EXTRACTED -->	06/19/01		06/19/01		06/19/01		06/19/01		06/19/01	
	DATE ANALYZED --->	06/21/01		06/21/01		06/21/01		06/21/01		06/21/01	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	46778	VAL	46778	VAL	46778	VAL	46778	VAL	46778	VAL
7439-92-1	Lead	1.2	U	1.2	U	1.2	U	1.2	UJ	11.8	J
7440-66-6	Zinc	5.1	J	6.	J	25.3		10.3	J	184.	J

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 10/01

HAL VOA													
	SAMPLE ID ------>	CAR-G-6010-01		CAR-G-6210-01		CAR-G-AS10-01		CAR-G-EW10-01		CAR-H-EW10-01		CAR-G-WW10-01	
	ORIGINAL ID ----->	CARG601001		CARG621001		CARGAS1001		CARGEW1001		CARHEW1001		CARGWW1001	
	LAB SAMPLE ID --->	S116969*3		S116969*4		S116969*5		S116969*6		S116969*7		S116969*8	
	ID FROM REPORT -->	CARG601001		CARG621001		CARGAS1001		CARGEW1001		CARHEW1001		CARGWW1001	
	SAMPLE DATE ----->	10/25/01		10/25/01		10/25/01		10/25/01		10/25/01		10/25/01	
	DATE ANALYZED --->	10/30/01		10/30/01		10/30/01		10/30/01		10/30/01		10/30/01	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ----------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.		0.95	J	0.29	J
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	2.6		110.	D	97.	D	180.	D
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 10/01

METALS	SAMPLE ID ------->	CAR-G-6010-01	CAR-G-6210-01	CAR-G-AS10-01	CAR-G-EW10-01	CAR-H-EW10-01	CAR-G-WW10-01
	ORIGINAL ID ----->	CARG601001	CARG621001	CARGAS1001	CARGEW1001	CARHEW1001	CARGWW1001
	LAB SAMPLE ID --->	S116969*3	S116969*4	S116969*5	S116969*6	S116969*7	S116969*8
	ID FROM REPORT -->	CARG601001	CARG621001	CARGAS1001	CARGEW1001	CARHEW1001	CARGWW1001
	SAMPLE DATE ----->	10/25/01	10/25/01	10/25/01	10/25/01	10/25/01	10/25/01
	DATE EXTRACTED -->	10/30/01	10/30/01	10/30/01	10/30/01	10/30/01	10/30/01
	DATE ANALYZED --->	11/01/01	11/01/01	11/01/01	11/01/01	11/01/01	11/01/01
	MATRIX ---------->	Water	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL	UTC01	VAL
7439-92-1	Lead	1.6	U	1.6	U	1.7	J	1.6	U	1.6	U	1.6	U
7440-66-6	Zinc	4.7	J	2.4	J	34.		15.	J	8.5	J	310.	

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 12/01

HAL VOA	SAMPLE ID ------>	CAR-G-6012-01	CAR-G-6212-01	CAR-G-AS12-01	CAR-H-AS12-01	CAR-G-EW12-01	CAR-G-WW12-01
	ORIGINAL ID ----->	CARG601201	CARG621201	S118124*3	S118124*4	S118124*6	S118124*5
	LAB SAMPLE ID --->	S118124*8	S118124*7	CARGAS1201	CARHAS1201	CARGEW1201	CARGWW1201
	ID FROM REPORT -->	CARG601201	CARG621201	12/12/01	12/12/01	CARGFW1201	12/12/01
	SAMPLE DATE ----->	12/12/01	12/12/01	12/17/01	12/17/01	12/12/01	12/17/01
	DATE ANALYZED --->	12/17/01	12/17/01	Water	Water	12/19/01	Water
	MATRIX ---------->	Water	Water	UG/L	UG/L	Water	UG/L
	UNITS ----------->	UG/L	UG/L			UG/L	

CAS #	Parameter	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.2		0.27	J
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	3.1		3.3		130.	D	190.	D
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

CARRIER, COLLIERVILLE
CARRIER, RD/RA MONITORING 12/01

METALS	SAMPLE ID ------>	CAR-G-6012-01	CAR-G-6212-01	CAR-G-AS12-01	CAR-H-AS12-01	CAR-G-EW12-01	CAR-G-WW12-01
	ORIGINAL ID ----->	CARG601201	CARG621201	CARGAS1201	CARHAS1201	CARGEW1201	CARGWW1201
	LAB SAMPLE ID --->	S118124*8	S118124*7	S118124*3	S118124*4	S118124*6	S118124*5
	ID FROM REPORT -->	CARG601201	CARG621201	CARGAS1201	CARHAS1201	CARGFW1201	CARGWW1201
	SAMPLE DATE ----->	12/12/01	12/12/01	12/12/01	12/12/01	12/12/01	12/12/01
	DATE EXTRACTED -->	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01
	DATE ANALYZED --->	12/18/01	12/18/01	12/18/01	12/18/01	12/18/01	12/18/01
	MATRIX ---------->	Water	Water	Water	Water	Water	Water
	UNITS ---------->	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L

CAS #	Parameter	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL	UTC02	VAL
7439-92-1	Lead	1.6	U	1.6	U	1.6	U	1.6	U	2.2	J	1.6	U
7440-66-6	Zinc	2.7	J	1.6	J	23.	J	48.	J	11.	J	34.	

*** Validation Complete ***

APPENDIX B

WATER PLANT 2 DATA

CARRIER COLLIERVILLE-WATER PLANT #2

TCE Data Results for City Wells CWE and CWW

Date	CWE (ppb)	CWE Avg.	CWW (ppb)	CWW Avg.	Notes:
06-Jun-90	0		22		
21-Aug-90	9		27		
19-Nov-90	28	12	45	31	
13-Apr-91	39	25	120	64	
19-Apr-91	20.41	29	102.5	89	
19-Nov-91	11	23	79	101	
15-May-92	48	26	130	104	
21-May-92	48	36	150	120	
28-May-92	55	50	120	133	
04-Jun-92	45	49	220	163	
11-Jun-92	47	49	140	160	
23-Jun-92	43	45	110	157	
10-Jul-92	48	46	120	123	
15-Jul-92	46	46	110	113	
23-Jul-92	45	46	110	113	
30-Jul-92	47	46	74	98	
06-Aug-92	48	47	140	108	
13-Aug-92	47	47	114	109	
20-Aug-92	46	47	120	125	
03-Sep-92	40	44	110	115	
08-Oct-92	34	40	110	113	
14-Oct-92	39	38	120	113	
22-Oct-92	33	35	110	113	
29-Oct-92	38	37	120	117	
31-Dec-92	19	30	130	120	
22-Jan-93	25	27	140	130	
27-Jan-93	30	25	160	143	
03-Feb-93	23	26	130	143	
11-Feb-93	34	29	110	133	
17-Feb-93	140	66	150	130	
25-Feb-93	26	67	120	127	
03-Mar-93	22	63	130	133	
10-Mar-93	17	22	140	130	
17-Mar-93	8.9	16	130	133	
24-Mar-93	13	13	130	133	
18-May-93	35	19	130	130	
21-Jun-93	31	26	120	127	
22-Jul-93	21	29	120	123	
08-Sep-93	9.3	20	130	123	
11-Oct-93	13	14	180	143	
11-Nov-93	13	12	180	163	
20-Dec-93	13	13	150	170	
16-Jun-94	28	18	110	147	
19-May-95	79	40	100	120	
21-Sep-95	81	63	94	101	
06-Dec-95	98	86	120	105	
20-Mar-96	130	103	100	105	
25-Jun-96	62	97	90	103	
25-Sep-96	63	85	120	103	
26-Nov-96	88	71	140	117	
11-Mar-97	94	82	170	143	
10-Jun-97	92.9	92	193	168	
23-Sep-97	96	94	180	181	
04-Dec-97	91	93	170	181	
05-Mar-98	97	95	156	169	
18-Jun-98	99	96	170	165	
17-Dec-98	80	92	170	165	
04-Mar-99	86	88	160	167	
22-Jun-99	91	86	160	163	
21-Sep-99	61	79	170	163	
12-Nov-99	78	77	150	160	
22-Feb-00	82	74	150	157	
06-Jun-00	NS	NS	180	160	NS = Not Sampled
21-Sep-00	76	79	150	160	
04-Dec-00	91	84	130	153	
29-Mar-01	100	89	NS	NS	Note CWW down during 1Q2001; NS = Not Sa
14-Jun-01	69	87	NS	NS	Note CWW down during 2Q2001; NS = Not Sa
25-Oct-01	97	89	180	153	
12-Dec-01	130	99	190	167	

Month	Gallons (MGD)	Quarterly Summary	Quarterly Total
Jan-00	32,410,000		
Feb-00	30,379,000		
Mar-00	29,794,000	1Q00	92,583,000
Apr-00	31,543,000		
May-00	32,606,000		
Jun-00	25,395,000	2Q00	89,544,000
Jul-00	31,642,000		
Aug-00	36,849,000		
Sep-00	35,692,000	3Q00	104,183,000
Oct-00	36,324,000		
Nov-00	32,142,000		
Dec-00	33,415,000	4Q00	101,881,000
Jan-01	33,116,000		
Feb-01	27,408,000		
Mar-01	31,280,000	1Q01	91,804,000
Apr-01	31,426,000		
May-01	37,575,000		
Jun-01	36,498,000	2Q01	105,499,000
Jul-01	37,193,000		
Aug-01	36,541,000		
Sep-01	33,584,000	3Q01	107,318,000
Oct-01	34,732,000		
Nov-01	33,838,000		
Dec-01	30,460,000	4Q01	99,030,000

CWE Quarter	CWE Avg (Moving) (ug/L)	Total Flow (MG)	CWE Flow (1/2 total) gallons	CWE Flow (1/2 total) liters	Mass Removed (kg)	Mass Removed (lbs)	Notes
1Q2000	74	92,583,000	46,291,500	175,907,700	13.0	28.5	
2Q2000	NS	89,544,000	44,772,000	170,133,600		0.0	Note CWE down during 2Q2000
3Q2000	79	104,183,000	52,091,500	197,947,700	15.6	34.3	
4Q2000	84	101,881,000	50,940,500	193,573,900	16.2	35.6	
1Q2001	89	91,804,000	91,804,000	348,855,200	31.0	68.3	Note CWW down during 1Q2001
2Q2001	87	105,499,000	105,499,000	400,896,200	34.7	76.4	Note CWW down during 2Q2001
3Q2001	89	107,318,000	53,659,000	203,904,200	18.1	39.8	
4Q2001	99	99,030,000	49,515,000	188,157,000	18.6	40.8	

Mass calculation = gallons removed x concentration (ug/L) x (3.8 L/gal) x (1 kg/ 1xE-09 ug) x (2.2 lbs/kg)

CWW Quarter	CWE Avg (Moving) (ug/L)	Total Flow (MG)	CWW Flow (1/2 total) gallons	CWW Flow (1/2 total) liters	Mass Removed (kg)	Mass Removed (lbs)	Notes
1Q2000	157	92,583,000	46,291,500	175,907,700	27.6	60.6	
2Q2000	160	89,544,000	44,772,000	170,133,600	27.2	59.9	Note CWE down during 2Q2000
3Q2000	160	104,183,000	52,091,500	197,947,700	31.7	69.7	
4Q2000	153	101,881,000	50,940,500	193,573,900	29.7	65.3	
1Q2001	NS	91,804,000	45,902,000	174,427,600		0.0	Note CWW down during 1Q2001
2Q2001	NS	105,499,000	52,749,500	200,448,100		0.0	Note CWW down during 2Q2001
3Q2001	153	107,318,000	53,659,000	203,904,200	31.3	68.8	
4Q2001	167	99,030,000	49,515,000	188,157,000	31.4	69.0	

Mass calculation = gallons removed x concentration (ug/L) x (3.8 L/gal) x (1 kg/ 1xE-09 ug) x (2.2 lbs/kg)

APPENDIX C

MPA/NRS SVE DATA

CARRIER COLLIERVILLE
MPA SVE ANALYTICAL RESULTS (BY MANIFOLD)

shallow-before carbon — **all concentrations ug/l**

date	El. Time (days)	Calender Time	Flow Rate (cfm)	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CC14	TCE	112TCA	PCE	VC	Total VOCs	
3-May-95	0	0	18	10	<1	10	<1	1150	<1	<1	<1	12000	<1	4.4	ns	13174	
19-May-95	16	16	18	18	<1	20	<1	404	4.9	<1	<1	9990	<1	12	ns	10449	
19-May-95	16.2	16	23	20	<1	20	<1	1380	1.7	<1	<1	6620	<1	9.2	ns	8051	
19-May-95	16.3	16	25	32	<1	35	<1	2140	2.8	<1	<1	13200	<1	14	ns	15424	
1-Jun-95	1	29	25	18	<1	32	<1	1012	2.8	<1	<1	13100	<1	7.2	ns	14172	
9-Jun-95	9	37	25	15	<1	18	<1	943	2.5	<1	<1	9190	<1	<1	ns	10169	
7-Jul-95	37	65	25	22	<1	18	<1	1190	3.3	<1	<1	4400	<1	<1	<10	5633	
7-Jul-95	37 5	65	25	34	<1	34	<1	1805	5.1		1.2	<1 6920	<1	<1	<10	8799	
29-Sep-95	121	149	25	15.9	<1	13	<1	878	2.15	<1	<1	1860	<1	<1	19.1	2788	
9-Oct-95	131	159	25	25.1	<1	9.38	<1	388	1.92	<1	<1	1520	<1	<1	<10	1944	
1-Nov-95	154	182	25	17 3	<1	11.4	<1	407	1.78	<1	<1	2090	<1	<1	<10	2527	
7-Dec-95	190	218	25	15.9	<1	5.56	<1	151	1.29	<1	<1	77.7	<1	<1	<10	251	
18-Mar-96	292	320	25	24.3	<1	5.73	<1	286	1.37	<1	<1	113	<1	<1	<10	430	
30-Apr-96	335	363	25	22.4	<1	3.47	<1	207	<1	<1	<1	80.5	<1	<1	<10	313	
29-May-96	364	392	25	7.97	<1	6.82	<1	218	1.24	<1	<1	83.6	<1	<1	<10	318	
24-Jun-96	390	418	25	4.91	<1	4.86	<1	142	<1	<1	<1	280	<1	<1	<10	432	
31-Jul-96	427	455	25	5.01	<1	7.83	<1	275	1.06	<1	<1	94.2	<1	<1	<10	383	
30-Aug-96	457	485	25	7.66	<1	9.94	<1	387	1.58	<1	<1	106	<1	<1	<10	512	
23-Sep-96	481	509	25	35	<1	11.5	<1	467	2.32	<1	<1	775	<1	<1	<10	1291	
15-Oct-96	503	531	25	15	<1	<1	<1	130	<1	<1	<1	356	<1	<1	<10	501	
10-Dec-96	559	587	25	5.11	<1	<1	<1	71.1	<1	<1	<1	270	<1	<1	<10	346	
31-Jan-97	610	639	25	<1	<1	<1	<1	38.5	<1	<1	<1	316	<1	<1	<10	355	
4-Mar-97	642	671	25	2.76	<1	<1	<1	34.2	<1	<1	<1	109	<1	<1	<10	146	
15-Apr-97	684	713	25	7.37	<1	3.96	<1	161	<1	<1	<1	505	<1	<1	<10	677	
29-May-97	728	757	25	8.75	<1	3.33	<1	151	<1	<1	<1	360	<1	<1	<10	523	
9-Jul-97	769	798	25	7	<1	3	<1	134	<1	<1	<1	400	<1	<1	<10	544	
7-Aug-97	798	827	25	<1	<1	<1	<1	16.1	<1	<1	<1	170	<1	<1	<10	186	
15-Oct-97	867	896	25	<1	<1	<1	<1	16	<1	<1	<1	184	<1	<1	<10	200	
9-Jan-98	953	982	25	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<10	1	
3-Mar-98	1006	1035	25	<1	<1	<1	<1	<1	<1	<1	<1	1.37	<1	<1	<10	1	
22-Apr-98	1056	1085	25	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<10	1	
28-Oct-98	7	1274	25	<1	<1	<1	<1	260	<1	<1	<1	620	<1	<1	<10	880	
24-Mar-99	153	1421	25	<1	<1	<1	<1	<1	<1	<1	<1	656	<1	<1	<10	656	
14-Apr-99	174	1442	25	<1	<1	<1	<1	228	<1	<1	<1	700	<1	<1	<10	928	
6-May-99	196	1464	25	<1	<1	<1	<1	288	<1	<1	<1	762	<1	<1	<10	1050	
22-Sep-99	335	1603	25	<1	<1	<1	<1	<1	<1	<1	<1	703	<1	5.09	<10	708	
18-Nov-99	392	1660	25	<1	<1	<1	<1	<1	<1	<1	<1	1172	<1	<1	<10	1172	
26-Apr-00	552	1820	25	<1	<1	<1	<1	<1	<1		2.01	<1 856	<1	<1	<10	858	
5-Jun-00	592	1860	25	<1	<1	<1	<1	<1	<1	<1	<1	600	<1	<1	<10	600	
1-Nov-00	741	2009	25	<1	<1	<1	<1	<1	<1	<1	<1	1170	<1	<1	<10	1170	
25-Jan-01	826	2094	25	<1	<1	<1	<1	<1	<1	<1	<1	2.54	<1	<1	<10	3	anomalous
26-Feb-01	858	2126	25	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	0	anomalous
2-May-01	916	2191	24	<1	<1	<1	<1	<1	<1	<1	<1	6.65	<1	<1	<10	7	anomalous
6-Nov-01	1104	2379	25	<1	<1	<1	<1	80	<1	<1	<1	52.3	<1	<1	<10	132	anomalous

CARRIER COLLIERVILLE

MPA SVE ANALYTICAL RESULTS (BY MANIFOLD)

deep-before carbon — all concentrations in ug/l

date	El. Time (days)		F.Rate (cfm)	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CC14	TCE	112TCA	PCE	VC	
3-May-95	0	0	40	8.4	<1	11	<1	199	2.3	<1	<1	16600	<1	5.8	ns	16827
19-May-95	16	16	40	25	<1	26	<1	1730	2.1	<1	<1	7860	<1	11	ns	9654
1-Jun-95	16.2	29	40	14	<1	14	1.5	305	3.8	<1	<1	9980	<1	9.6	ns	10328
7-Jul-95	16.3	65	40	17	<1	17	<1	352	4.4	<1	<1	11800	<1	10	ns	12200
29-Sep-95	149	149	45	2.11	<1	3.03	<1	147	<1	<1	<1	516	<1	<1	<10	668
18-Mar-96	320	320	65	1.29	<1	2.34	1.69	98.9	1.65	<1	<1	96.1	<1	<1	<10	202
30-Apr-96	363	363	25	10.9	<1	5.17	<1	62.8	1.84	<1	<1	77.1	<1	<1	<10	158
31-Jul-96	455	455	35	7.08	<1	5.89	<1	127	1.84	<1	<1	102	<1	<1	<10	244
10-Dec-96	587	587	35	3.77	<1	<1	<1	14.3	<1	<1	<1	250	<1	<1	<10	268
30-Jun-97	640	789	35	13.8	<1	2.11	<1	27.4	13.8	<1	<1	356	<1	<1	<10	413
2-Jun-98	28	1126	35	<1	<1	<1	<1	<1	<1	<1	<1	31.8	<1	<1	<10	32
16-Jul-98	73	1170	35	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<10	1
28-Oct-98	6	1274	35	<1	<1	<1	<1	235	<1	<1	<1	580	<1	<1	<10	815
2-Dec-98	10	1309	35	<1	<1	<1	<1	335	<1	<1	<1	752	<1	<1	<10	1087
7-Jan-99	46	1345	35	<1	<1	<1	<1	362	<1	<1	<1	760	<1	<1	<10	1122
7-Mar-00	na	1770	60	14.9	<1	<1	<1	<1	<1	2.51	<1	1042	<1	<1	<10	1059
15-Sep-00	na	1962	35	<1	<1	<1	<1	<1	<1	<1	<1	248	<1	<1	<10	248
25-Jan-01	na	2094	35	<1	<1	<1	<1	<1	<1	<1	<1	311	<1	<1	<10	311
26-Feb-01	na	2126	35	<1	<1	<1	<1	<1	<1	<1	<1	136	<1	<1	<10	136
2-May-01	na	2191	35	<1	<1	<1	<1	<1	<1	<1	<1	750	<1	<1	<10	750
6-Nov-01		2379	35	<1	<1	<1	<1	145	<1	<1	<1	1002	<1	<1	<10	1147

shallow/deep-before carbon — all concentrations in ug/l

date	El. Time (days)		F.Rate (cfm)	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CC14	TCE	112TCA	PCE	VC	
3-May-95	0		40	12	<1	15	<1	350	3.1	<1	<1	25800	<1	7.6	ns	26188
19-May-95	16.3		40	16	<1	19	<1	533	3.4	<1	<1	10500	<1	9.3	ns	11081
25-Jan-01	826	2094	25	<1	<1	<1	<1	<1	<1	<1	<1	403	<1	<1	<10	403
26-Feb-01	858	2126	25	<1	<1	<1	<1	<1	<1	<1	<1	159	<1	<1	<10	159
2-May-01	916	2191	24	<1	<1	<1	<1	<1	<1	<1	<1	1014	<1	<1	<10	1014
6-Nov-01	1104	2379	25	<1	<1	<1	<1	80	<1	<1	<1	625	<1	<1	<10	705

horizontal #1-before carbon — all concentrations in ug/l

Date	E-Time (days)		F.Rate (cfm)	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CC14	TCE	112TCA	PCE	VC	
29-Sep-95	0		30	1.48	<1	5.62	<1	864	<1	1	<1	1020	<1	<1	<10	1892
3-Oct-95	5		30	<1	<1	<1	<1	35.4	<1	<1	<1	150	<1	<1	<10	185
	5.2		30	<1	<1	<1	<1	16.1	<1	<1	<1	110	<1	<1	<10	126
	5.3		30	<1	<1	<1	<1	25.5	<1	<1	<1	110	<1	<1	<10	136
	5.4		30	<1	<1	<1	<1	31	<1	<1	<1	155	<1	<1	<10	186
4-Oct-95	6		25	<1	<1	<1	<1	12.6	<1	<1	<1	84.5	<1	<1	<10	97
5-Oct-95	7		27	<1	<1	<1	<1	11	<1	<1	<1	74.3	<1	<1	<10	85
31-Jul-96	306		27	3.31	<1	2.06	<1	30.1	1.01	<1	<1	86.1	<1	<1	<10	123
10-Jan-98	na		30	<1	<1	<1	<1	237	<1	<1	<1	269	<1	<1	<10	506
16-Jul-98	na		30	<1	<1	<1	<1	<1	<1	<1	<1	1.63	<1	<1	<10	2
1-Nov-00	na		30	<1	<1	<1	<1	<1	<1	<1	<1	1350	<1	1.45	<10	1351

CARRIER COLLIERVILLE
MPA SVE ANALYTICAL RESULTS (BY MANIFOLD)

horizontal #2-before carbon — all concentrations in ug/l

Date	E-Time (days)	F.Rate (cfm)	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CC14	TCE	112TCA	PCE	VC	
3-Oct-95	0	30	<1	<1	<1	<1	43.6	<1	<1	<1	13.8	<1	<1	<10	57
		30	<1	<1	<1	<1	49.2	<1	<1	<1	18.8	<1	<1	<10	68
		30	<1	<1	<1	<1	46	<1	<1	<1	20.6	<1	<1	<10	67
		30	<1	<1	<1	<1	26	<1	<1	<1	6.7	<1	<1	<10	33
4-Oct-95	1	25	<1	<1	<1	<1	14.6	<1	<1	<1	5.3	<1	<1	<10	20
31-Jul-96	302	30	3.22	<1	1.62	<1	24.4	<1	<1	<1	85.1	<1	<1	<10	114
10-Jan-98	na	30	<1	<1	<1	<1	264	<1	<1	<1	267	<1	<1	<10	531
1-Nov-00	na	30	<1	<1	<1	<1	<1	<1	<1	<1	890	<1	<1	<10	890

horizontal #1&#2-before carbon — all concentrations in ug/l

Date	E-Time (days)	F.Rate (cfm)	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CC14	TCE	112TCA	PCE	VC	
14-Sep-98	0	70	<1	<1	17.5	<1	1650	<1	<1	<1	1100	<1	3.86	<10	2771
	0	70	<1	<1	5.93	<1	837	<1	<1	<1	830	<1	1.38	<10	1674
18-Sep-98	4	70	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<10	1
15-Oct-98	31	70	<1	<1	<1	<1	168	<1	<1	<1	495	<1	<1	<10	663

water in line

Carrier Collierville
MPA - Shallow Wells

Quarter	Days Operational	(ug/L)	Flow Rate (cfm)	Shallow (lbs/day)	Shallow (lbs/quarter)
1Q01	43	550	70	3.5	148
2Q01	91	550	70	3.5	314
3Q01	91	550	70	3.5	314
4Q01	61	550	70	3.5	211
2001 Total					**987**

rem. rate eqn is: (ug/L) x (1x10^-6g/ug) x (1440min/day) x (ft^3/min) x (28.3L/ft^3) x (lb/454g)

APPENDIX D

HISTORICAL MASS REMOVAL NUMBERS

CARRIER COLLIERVILLE
NRS SVE ANALYTICAL DATA
All concentrations ug/L

		TCE Shallow	TCE Deep
2-Dec-93		0.6	128
24-Jan-94	0	1673	48
31-Mar-94	66	595	10
27-Jun-94	154	1020	8.8
20-Oct-94	269	504	14
14-Feb-95	386	110	3.5
23-Jun-95	515	52	4.8
25-Sep-95	609	49.7	3.38
7-Dec-95	682	47.2	1.05
18-Mar-96	784	68.7	7.15
24-Jun-96	882	68.6	3.59
30-Sep-96	980	68.1	10.9
10-Dec-96	1051	117	2.26
4-Mar-97	1135	135	3.61
30-Jun-97	1253	219	4.39
4-Oct-97	1349	221	9.28
2-Feb-98	1470	215	4.6
15-Sep-98	1695	882	100
15-Sep-98	1695	889	102
1-Dec-98	1772	418	14.4
25-Feb-99	1858	275	6.06
14-Apr-99	1906	240	5.49
6-May-99	1928	48.2	11.1
22-Sep-99	2067	570	8.9
10-Dec-99	2146	277	9.52
26-Apr-00	2284	2.17	1.26
15-Sep-00	2426	302	9.92
25-Jan-01	2558	1460	97.1
26-Feb-01	2590	2.37	6.19
2-May-01	2655	216	11.1

Carrier Collierville
NRS - Shallow Wells

Quarter	Days Operational	Average for Quarter (ug/L)	Flow Rate (cfm)	Shallow (lbs/day)	Shallow (lbs/quarter)
3Q98				0.0	0
4Q98	91	275	20	0.5	45
1998 Total					**45**
1Q99	90	275	20	0.5	44
2Q99	91	275	20	0.5	45
3Q99	91	275	20	0.5	45
4Q99	91	275	20	0.5	45
1999 Total					**179**
1Q00	90	275	20	0.5	44
2Q00	91	275	20	0.5	45
3Q00	91	275	20	0.5	45
4Q00	91	275	20	0.5	45
2000 Total					**179**
1Q01	90	275	20	0.5	44
2Q01	91	275	20	0.5	45
3Q01	91	275	20	0.5	45
4Q01	31	275	20	0.5	15
2001 Total					**149**

rem. rate eqn is: (ug/L) x (1x10^-6g/ug) x (1440min/day) x (ft^3/min) x (28.3L/ft^3) x (lb/454g)

Carrier Collierville
NRS Deep Wells

Quarter	Days Operational	Average for Quarter (ug/L)	Flow Rate (cfm)		Shallow (lbs/day)	Shallow (lbs/quarter)
3Q98					0.0	0
4Q98	91	9.0	180		0.1	13
1998 Total						**13**
1Q99	90	9.0	180		0.1	13
2Q99	91	9.0	180		0.1	13
3Q99	91	9.0	180		0.1	13
4Q99	91	9.0	180		0.1	13
1999 Total						**53**
1Q00	90	9.0	180		0.1	13
2Q00	91	9.0	180		0.1	13
3Q00	91	9.0	180		0.1	13
4Q00	91	9.0	180		0.1	13
2000 Total						**53**
1Q01	90	9.0	180		0.1	13
2Q01	91	9.0	180		0.1	13
3Q01	91	9.0	180		0.1	13
4Q01	31	9.0	180		0.1	5
2001 Total						**44**

rem. rate eqn is: (ug/L) x (1x10^-6g/ug) x (1440min/day) x (ft^3/min) x (28.3L/ft^3) x (lb/454g)